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PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of

Docket No: Q61786

Kyoko HIGASHINO, et al.

Appln. No.: 09/737,564

Group Art Unit: 2834

Confirmation No.: 9907

Examiner: Pedro J. Cuevas

Filed: December 18, 2000

For: STATOR FOR AN ALTERNATOR

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REQUEST FOR RECONSIDERATION UNDER 37 C.F.R. § 1.111

Commissioner for Patents
Washington, D.C. 20231

Sir:

In response to the Office Action dated November 20, 2002, reconsideration and allowance of the subject application are respectfully requested. Upon entry of this request, claims 1, 2 and 5-10 are pending in the application. Applicant respectfully submits that the pending claims define patentable subject matter.

I. Rejection of Claims 1, 2 and 5-10 under 35 U.S.C. § 103 as being unpatentable over Umeda et al. in view of Shichijyo et al.

A. Disclosure of Umeda et al.

Umeda et al. (U.S. Patent No. 6,204,586; hereinafter "Umeda") discloses a stator of a vehicle AC generator includes a stator core having a plurality of slots and a plurality of phase-windings formed of a plurality of conductor members inserted in said plurality of slots. The stator winding has first and second coil-end groups formed of portions of the conductor members

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respectively extending from the slots to opposite ends of the stator core. Each of the phase-windings has a lead-end which is partially covered with an insulation member and extends along the first coil-end group to be connected to one another. The insulation member is bonded to the first coil-end group.

As shown in Figures 8-10, lead-ends X1 and Z1 of a first coil-end group 31a are extended along the ridge line of the first coil-end group 31a to be connected to a lead-end Y1, which extends in the axial direction, to form a neutral point 33k. The lead-end X1 is partly covered by flexible textile insulation tube 333. The lead-ends X1 and Z1 have a rectangular cross-section and are disposed on the ridge with their longer side down. The insulation tube 333 is bonded to the first coil-end group 31a by an adhesive made of an epoxy resin. The other lead-ends X2, Y2 and Z2 extend from the first coil-end group 31a and are connected to the respective input terminals of a rectifier 5.

As shown in Figures 13-14, a plurality of portions of the lead-ends X1 and Z1 are covered with an insulation adhesive 336 made of a heat-resistant material such as epoxy resin or silicone resin in order to bond the lead-ends X1 and Z1 to the ridge of first coil-end group 31a.

As shown in Figures 15 and 16, the lead-ends X1 and Z1 have bent portions B1 as well as a common neutral point 33k. The lead-ends X1 and Z1 respectively extend along the ridge of first coil-end group 31a and are bonded to the ridge at a plurality of portions thereof at bonded portions 338, which are formed from liquid resin 337. In other words, the bonded portions 338 are formed in gaps between the lead-ends X1 and Z1 and edges of turn portions 331c of the first coil-end group 31a.

B. Disclosure of Shichijyo et al.

Shichijyo et al. (U.S. Patent No. 6,275,404; hereafter "Shichijyo") is directed to a rectifier unit for an AC generator which includes a rotor, a stator having a three-phase stator winding and a frame for rotatably supporting the rotor. As shown in Figures 1 and 2, the rectifier unit 6 includes a negative cooling fin 62, a positive cooling fin 63, a terminal member 61, four negative diodes 62 fixed to the negative cooling fin 62, and four positive diodes 66 fixed to the positive cooling fin 63. The negative cooling fin 62 and the positive cooling fin 63 are formed as arc-shaped members which disposed parallel to the axial direction at a distance from each other. Each of the negative diodes 65 and the positive diodes 66 has a lead wire at the other end thereof, which is welded to one of the wiring terminals 69 extending from the terminal member 61. The wiring terminals 69 are molded with a resinous insulation material to form terminal member 61. Each of the negative diodes 65 is paired with the closest one of the positive diodes 66, thereby forming four pairs of series connected negative and positive diodes 65 and 66. The negative diode 65 of each of the pairs and the positive diode 66 thereof are respectively welded to a pair of outside and inside wiring terminals 69 of terminal member 61. The wiring terminals 69 are respectively connected to four leads 68 (three output leads and a neutral lead) of stator winding 23 by bolts or screws.

As shown in Figures 3-5 where the wiring terminals 69 are renumbered 691a, 691b and 691c through 694a, 694b and 694c, semi-cylindrical partition members 71 are respectively formed in each terminal member 61 to extend left or in the axial direction of the rotor 3. The

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four leads 68 extending from stator winding 23 are respectively connected to input wiring terminals 691c-694c by screws. Each of the partition members 71 extends in the axial direction of the rotor 3 between one of connecting portions 72 and the outer periphery of positive cooling fin 63. Alternatively, the semi-cylindrical partition member 71 can be replaced with a flat partition member 271a, L-shaped partition member 271b or U-shaped partition member 271c, as shown in Figures 10, 11 or 12.

C. Analysis

The Examiner maintains that Umeda discloses all of the features of independent claim 1 except for the claimed connecting member, which the Examiner asserts is disclosed by the rectifier arrangement of Shichijyo. Further, the Examiner asserts that “[i]t would have been obvious ... to use the rectifier arrangement of Shichijyo et al. on the stator disclosed by Umeda et al. for the purpose of electrically connect[ing] the stator coil neutral point to the rectifier.”

Applicant respectfully submits that the claimed invention would not have been rendered obvious in view of Umeda and Shichijyo. In particular, even if Umeda and Shichijyo are combined as proposed by the Examiner (which we believe is incorrect) the resulting alternator assembly would not include a stator comprising “a connecting member including a conductor having flat side surface portions, said flat side surface portions of said neutral-point terminals and said connecting member being abutted and electrically joined to each other to form a neutral-point joint portion of said stator winding”, as recited in independent claim 1.

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As the Examiner correctly notes in the Office Action, Umeda does not teach or suggest the claimed connecting member. However, the Examiner asserts that terminal members 61 shown in Figures 10-12 of Shichijyo correspond to the claimed connecting member. Applicant respectfully disagrees with the Examiner's position.

As discussed above, Shichijyo discloses a rectifier unit of an AC generator including a plurality of partition members 71 which extend in the axial direction of rotor 3 between connecting portions 72 and the outer periphery of positive cooling fin 63, so that each partition member 71 surrounds one of the connecting portions 72 to prevent water or electrolytes flowing along the surface of the cooling fin structure from reaching the connecting portion 72. However, Shichijyo does not teach or suggest how to join neutral-point terminals.

As shown in Figures 10-12, the rectifier unit further includes terminal members 61 (which the Examiner asserts corresponds to the claimed connecting member) having a wiring terminals 69 which are connected to the positive and negative diodes and connected to the neutral lead and the output leads of the stator winding by screws or bolts. However, the terminal members 61 (including the wiring terminals 69) of Shichijyo are part of the rectifier assembly rather than the stator winding. That is, the terminal members 61 are terminals of the rectifier to which a lead wire of the stator winding is joined.

Nonetheless, the lead 68 of Shichijyo is similar to the connecting member of the present invention in that the lead 68 is joined to a wiring terminal 1692a of the terminal member 61. However, as shown in Figure 18, the lead 68 has a circular section.

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Accordingly, Shichijyo does not teach or suggest a connecting member having flat side surface portions connected to the rectifier, as claimed. Further, Shichijyo does not teach or suggest the claimed feature that the flat side surfaces of the neutral-point terminals and the connecting member are abutted and electrically joined to each other, because Shichijyo does not teach or suggest how to join neutral-point terminals.

Accordingly, Applicant respectfully submits that it is quite clear that if Umeda and Shichijyo are combined as proposed by the Examiner, the resulting alternator assembly would not include a stator having a connecting member with flat side surface portions abutted and electrically joined to flat side surface portions of the neutral-point terminals to form a neutral-point joint portion of the stator winding, as claimed.

Further, Applicant respectfully submits that one of ordinary skill in the art would not have been motivated to modify the stator assembly of Umeda based on the teachings of Shichijyo since Umeda (Figure 8) teaches that the neutral point 33k of the Y-shaped phase winding is not connected to the rectifier assembly. Thus, one of ordinary skill in the art would not have been motivated to connect the neutral point 33k of the Y-shaped phase winding of Umeda to a wiring terminal of a rectifier assembly as the Examiner proposes.

Similarly, Applicant respectfully submits that the dependent claim 8 and 9 (directed the fourth and fifth embodiments of the present invention shown in Figures 7 and 8) should be allowable because it is quite clear that neither Umeda nor Shichijyo teaches or suggests the claimed structure of the connecting member and/or the claimed connection between the connecting member and the neutral point terminals, as recited in dependent claims 8 and 9.

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Lastly, although the Examiner does not appear to address the subject matter of independent claim 10 (which is directed to the third embodiment of the present invention shown in Figure 6), Applicant respectfully submits that it is quite clear that neither Umeda nor Shichijyo teaches or suggests a neutral-point joint portion wherein the neutral-point terminals are stacked in axial direction, as recited in claim 10. Rather, Umeda discloses that a neutral-point joint portion wherein the neutral-point terminals are stacked in the circumferential direction and Shichijyo provides no teachings regarding the neutral-point joint portion.

Accordingly, independent claims 1 and 10, as well as dependent claims 2 and 5-9, should be allowable because the applied references, alone or combined, do not teach or suggest all of the features of the claims.

II. Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

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The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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